

Serial No.: 10/806,248  
Confirmation No.: 1774  
Applicant: SIGL, Marcus  
Atty. Ref.: 54401

**REMARKS:**

**REMARKS REGARDING CLAIMS:**

Claim 1 has been amended, claims 7 and 9 cancelled and entry is hereby requested for new claims 10 – 15. Description of the invention at page 4, lines 3 – 8 provides support for claim 10. Claims 11 – 14 find support on page 4, lines 19 – 31 and Examples 1 – 3 provide support for claim 15. Claims 1, 2 – 6, 8 and 10 - 15 are pending in the present application.

Applicants acknowledge with appreciation that claim 6 has been allowed.

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**IN RESPONSE TO THE OFFICE ACTION:**

**CLAIMS OBJECTIONS - 37 C.F.R. §1.75(c)**

The Office Action indicated objection to claim 8 under 37 C.F.R. §1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Claim 6 of the present invention requires "calcined zeolitic catalysts which have not been deactivated by a hydroamination - - -." As recited, the method according to claim 6 encompasses two types of catalyst including one, a "virgin" catalyst, that has never been used in the preparation of alkylamines. The second type of catalyst is a regenerated catalyst that was involved previously in the preparation of alkylamines. Catalyst deactivation occurred during formation of alkylamines requiring catalyst regeneration to place the catalyst back in a condition wherein it "has not been deactivated by a hydroamination" as required by claim 6 of the present invention.

Dependent claim 8 further limits claim 6 to catalyst materials (virgin catalysts) that were never involved previously in hydroamination. Claim 8 has been amended to clarify this distinction.

Applicants believe that amendment of claim 8 places it in condition for allowance. Request is made for reconsideration and withdrawal of objection to claim 8.

**REJECTION UNDER 35 U.S.C. § 112:**

The Office Action includes rejection of claims 1, 2 and 7 as being indefinite due to lack of clarity alleged by the Examiner with regard to 24 hour or 6 hour use limitations affecting catalysts according to the present invention. Further justification of rejection of claims 1, 2 and 7 includes a paragraph that is included as follows with emphasis added for convenient reference and discussion:

The examiner respectfully suggests that the 24 hour or 6 hour use limitation is so unclear, as a description of the catalyst, as to be meaningless. This is so because it is not a direct measure of the catalyst's activity/enhancement, but merely a crude indirect measure of any such activity/enhancement.

Applicants submit that the present application at page 3, lines 31 - 35 clearly states requirement of thermally treating/activating a zeolite catalyst to increase its hydroamination

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activity for preparing alkylamines. The present invention requires thermal activation of the catalyst "not more than 24 hours before commencement of the (alkylamine forming) reaction." Further by referring to Example 1 on page 11 of the present application, it is clear that a catalyst, activated according to the present invention, stored for 1 day (24 hours) provides a yield of t-butylamine of 15.0 mol%, which is slightly less than the 15.5 mol% of a sample of the same catalyst stored for 58 days then used immediately following thermal activation. Between the first day and the fifty eighth day the activity of the catalyst drops and the yield of t-butylamine falls as low as 13.2 mol%.

The table of Example 1 clearly shows that after 24 hours the activity of the catalyst begins to decrease. This suggests the need to use the catalyst whilst it retains its highest activity, i.e. in less than one day or 24 hours. Consequently, the 24 hour requirement is quite clear and not meaningless. Example 1 provides clear evidence that catalytic activity is a function of time. Variation of temperature or pressure or other environmental condition may have an effect, but the Examiner provides no support for asserting involvement of these environmental factors.

Time is not used to describe the catalyst itself. Rather "Time" is used as a process parameter, according to claim 1, requiring that "reacting olefins with ammonia, primary or secondary amines under hydroaminating conditions over a calcined zeolitic catalyst, having increased activity" takes place "within 24 hours of thermal activation" of the catalyst "at from 100°C to 550°C in a gaseous stream of air, nitrogen, other inert gases or mixtures - - - ." Claims of the present invention do not include a process where the thermal activation of the catalyst precedes hydroamination of olefins by more than 24 hours.

Reaction procedures commonly use time variables during process steps for a variety of reasons including temperature and pressure adjustment and addition of reactants, for example. In some processes time is not critical, but in the case of the present invention time between catalyst activation and its use in hydroamination influences the technical result of product yield.

With reference to page 4, lines 1 - 7 applicants submit that the description of the present invention is clear regarding the use of a thermally activated catalyst within 24 hours. A shorter time than 24 hours, such as 2 hours and 6 hours included in the specification, represents

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desirable earlier use of the catalyst well before its expected decline in activity. It is preferable to use the catalyst immediately after thermal activation.

Claims 3 - 5 also stand rejected under 35 USC 112, second paragraph, as "claims which depend from indefinite claims are also indefinite. *Ex parte Cordova*, 10 USPQ 2d 1949, 1952 (PTO Bd. App. 1989)."

Evidence discussed above shows that claims 1 and 2 are allowable. Claims 3 - 5 depend from allowable claim 1 and should likewise be allowable.

Since claim 7 has been cancelled, applicants request reconsideration and withdrawal of the rejection of claims 1 and 2 - 5 under 35 U.S.C. §112.

REJECTION UNDER 35 U.S.C. §103:

The Office Action includes rejection of claims 1 - 3 and 5 under 35 U.S.C. §103(a) as being unpatentable over CA 1,216,596 (Taglieber et al.) even though the Examiner's admits, with respect to claim 1 of the present invention, that Taglieber et al. (CA 1,216,596) fails to teach the deterioration of catalyst activity after a period of 24 hours. Following this admission, the Examiner asserts that, "the arbitrary 24 hour or 6 hour use limitation (for the catalyst) is devoid of meaning because it leads to a legally and logically inconsistent conclusion." The Office Action is silent regarding the nature of the conclusion and how such conclusion it is legally and logically inconsistent. Also, the Examiner provides no evidence to support the apparently arbitrary determination that the 24 hour limitation lacks meaning.

Examination of claims 1 - 3 and 5 appears to favor evidence that the catalyst of Taglieber et al. is calcined in a similar way to catalysts of the present invention (See the reference Page 3, lines 15 - 20) and catalyst regeneration is possible after deactivation of the catalyst by coking (Page 3, line 56 to Page 4, line 5). It is important also to note that the reference teaches at page 1, lines 17 - 22, under the heading Preparation of Amines, "- - - in the preparation of amines from an olefin and ammonia or a primary or secondary amine at from 80 to 400°C and under from 40 to 700 bar in the presence of a zeolite catalyst, the catalyst used has a long life - - -"

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(emphasis added). This statement teaches catalytic activity of a zeolite catalyst for a long time. No limitation of catalyst lifetime is evident from Taglieber et al., which teaches away from the need to use the catalyst within 24 hours of thermal activation, as required by claim 1 of the present invention. It is an improvement (35 U.S.C. §101) over CA 1 216 596 that the catalyst of claim 1 of the present invention optimizes the yield of amine product.

The reference fails to teach an additional activation step for an already calcined catalyst used in the preparation of alkylamines by a hydroamination reaction. This additional step is useful in cases when the regenerated catalyst sits in storage for more than 24 hours before participating in a hydroamination reaction. One of ordinary skill in the art is likely to conclude that the "long life" feature of catalysts taught by the reference will provide optimum catalytic activity beyond a relatively short 24 hour period. The impact of the 24 hour limit on optimal catalytic activity becomes evident when a manufacturer of catalyst pellets (see the reference page 3, lines 25 - 28) distributes the product to customers. Delivery from the manufacturing site to customer location could easily exceed 24 hours. Based on the "long life" catalyst teachings of Taglieber et al., a customer would not suspect the loss of catalyst activity described in the present application.

Examples 1 - 3 of the present invention generally indicate higher yields of amines than those taught by CA 1 216 596. There is nothing in the reference that would lead someone skilled in the art to expect the increased yields associated with the thermal activation process according to claim 1 of the present invention.

Claims 1 - 3 and 5 are directed to thermal activation of a calcined catalyst. There is no hint in Taglieber et al. that a regenerated catalyst (i.e. one calcined to burn off coke) will lose some activity within 24 hours. As discussed previously, this fact has significance to the output and cost of manufacturing alkylamines using catalyst pellets, for example, obtained from a catalyst manufacturer. Unless evidence exists to the contrary, the benefits of time-limited use of thermally activated catalysts according to claims 1 and 2 of the present invention should not be arbitrarily discounted.

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The previous discussion provides evidence that CA 1 216 596 (Taglieber et al.) fails to teach or suggest all the limitations of claims 1 - 3 and 5 of the present invention. Applicant submits that the requirement and burden of presenting of a *prima facie* case of obviousness under 35 USC §103 have not been met. Accordingly, request is made for reconsideration and withdrawal of the rejection of claims 1 - 3 and 5 under 35 USC §103(a).

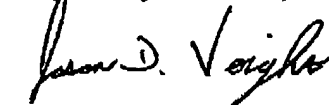
#### CONCLUSION

Regarding the prior art made of record and not relied upon by the Examiner, applicants find that United States Patent No. 5,174,976 is not pertinent to the present invention since it contains no hint of an additional activation step.

Applicants have made an earnest attempt to respond to all the points included in the Office Action and, in view of the above, submit that amendment of claim 1 and claim 8 and cancellation of claims 7 and 9 places the application in condition for allowance. Consequently, request is respectfully made for reconsideration of the application and notification of allowance of claims 1 - 6, 8 and 10 - 15 in the next paper from the Office.

Please charge the one-month extension fee to the credit card listed on the enclosed form PTO-2038. Please charge any shortage in fees due in connection with the filing of this paper to Deposit Account No. 14.1437. Please credit any excess fees to such account.

Respectfully submitted,



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